

GIFE

Serial Number: 09/645,321

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#3

- ☐ Changed a file from non-ASCII to ASCII
- ☐ Changed the margins in cases where the sequence text was "wrapped" down to the next line
- ☐ Edited a format error in the Current Application Data section, specifically: _____
- ☐ Edited the Current Application Data section with the actual current number. The number inputted by the applicant was ☐ the prior application data; or ☐ other _____
- ☐ Added the mandatory heading and subheadings for "Current Application Data".
- ☐ Edited the "Number of Sequences" field. The applicant spelled out a number instead of using an integer.
- ☐ Changed the spelling of a mandatory field (the headings or subheadings), specifically: _____
- ☐ Corrected the SEQ ID NO when obviously incorrect. The sequence numbers that were edited were: _____
- ☐ Inserted or corrected a nucleic number at the end of a nucleic line. SEQ ID NO's edited: _____
- ☐ Corrected subheading placement. All responses must be on the same line as each subheading. If the applicant placed a response below the subheading, this was moved to its appropriate place.
- ☐ Inserted colons after headings/subheadings. Headings edited included: _____
- ☐ Deleted extra, invalid, headings used by an applicant, specifically: _____
- ☐ Deleted: ☐ non-ASCII "garbage" at the beginning/end of files; ☐ secretary initials/filename at end of file; ☐ page numbers throughout text; ☐ other invalid text, such as _____
- ☐ Inserted mandatory headings, specifically: _____
- ☐ Corrected an obvious error in the response, specifically: _____
- ☐ Edited identifiers where upper case is used but lower case is required, or vice versa.
- ☐ Corrected an error in the Number of Sequences field, specifically: _____
- ☒ A "Hard Page Break" code was inserted by the applicant. All occurrences had to be deleted.
- ☐ Deleted *ending* stop codon in amino acid sequences and adjusted the "(A)Length:" field accordingly (error due to a PatentIn bug). Sequences corrected: _____
- ☐ Other: _____

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SEP 29 1994
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*Examiner: ~~The above corrections must be communicated to the applicant in the first Office Action.~~ DO NOT send a copy of this form.

3/1/95

0.2000

TECH CENTER 1600/2900
OIPE

RAW SEQUENCE LISTING
PATENT APPLICATION: US/09/645,321
DATE: 09/14/2000
TIME: 16:50:58

Input Set : A:\Cpg.pto
Output Set: N:\CRF3\09142000\I645321.raw

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3 <110> APPLICANT: Satoshi KOIZUMI
4      Kazuhiko TABATA
5      Tetsuo ENDO
6      Akio OZAKI
8 <120> TITLE OF INVENTION: Process for producing N-acetylneuraminic acid
10 <130> FILE REFERENCE: 11229
C--> 12 <140> CURRENT APPLICATION NUMBER: US/09/645,321
C--> 12 <141> CURRENT FILING DATE: 2000-08-25
12 <150> PRIOR APPLICATION NUMBER: H11-242670
13 <151> PRIOR FILING DATE: 1999-08-30
15 <160> NUMBER OF SEQ ID NOS: 8
17 <170> SOFTWARE: PatentIn Ver. 2.0
19 <210> SEQ ID NO: 1
20 <211> LENGTH: 391
21 <212> TYPE: PRT
22 <213> ORGANISM: Synechocystis sp.(PCC6803)
24 <400> SEQUENCE: 1
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26      1          5          10          15
28 Leu His Gln Asp Val Leu Pro Phe Trp Glu Lys Tyr Ser Leu Asp Arg
29      20          25          30
31 Gln Gly Gly Gly Tyr Phe Thr Cys Leu Asp Arg Lys Gly Gln Val Phe
32      35          40          45
34 Asp Thr Asp Lys Phe Ile Trp Leu Gln Asn Arg Gln Val Trp Gln Phe
35      50          55          60
37 Ala Val Phe Tyr Asn Arg Leu Glu Pro Lys Pro Gln Trp Leu Glu Ile
38      65          70          75          80
40 Ala Arg His Gly Ala Asp Phe Leu Ala Arg His Gly Arg Asp Gln Asp
41      85          90          95
43 Gly Asn Trp Tyr Phe Ala Leu Asp Gln Glu Gly Lys Pro Leu Arg Gln
44      100         105         110
46 Pro Tyr Asn Val Phe Ser Asp Cys Phe Ala Ala Met Ala Phe Ser Gln
47      115         120         125
49 Tyr Ala Leu Ala Ser Gly Ala Gln Glu Ala Lys Ala Ile Ala Leu Gln
50      130         135         140
52 Ala Tyr Asn Asn Val Leu Arg Arg Gln His Asn Pro Lys Gly Gln Tyr
53      145         150         155         160
55 Glu Lys Ser Tyr Pro Gly Thr Arg Pro Leu Lys Ser Leu Ala Val Pro
56      165         170         175
58 Met Ile Leu Ala Asn Leu Thr Leu Glu Met Glu Trp Leu Leu Pro Pro
59      180         185         190
61 Thr Thr Val Glu Glu Val Leu Ala Gln Thr Val Arg Glu Val Met Thr
62      195         200         205
64 Asp Phe Leu Asp Pro Glu Ile Gly Leu Met Arg Glu Ala Val Thr Pro
65      210         215         220
67 Thr Gly Glu Phe Val Asp Ser Phe Glu Gly Arg Leu Leu Asn Pro Gly
68      225         230         235         240

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PATENT APPLICATION: US/09/645,321

DATE: 09/14/2000

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Input Set : A:\Cpg.pto

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70 His Gly Ile Glu Ala Met Trp Phe Met Met Asp Ile Ala Gln Arg Ser
71                215                250                255
73 Gly Asp Arg Gln Leu Gln Glu Gln Ala Ile Ala Val Val Leu Asn Thr
74                260                265                270
76 Leu Glu Tyr Ala Trp Asp Glu Glu Phe Gly Gly Ile Phe Tyr Phe Leu
77                275                280                285
79 Asp Arg Gln Gly His Pro Pro Gln Gln Leu Glu Trp Asp Gln Lys Leu
80                290                295                300
82 Trp Trp Val His Leu Glu Thr Leu Val Ala Leu Ala Lys Gly His Glu
83 305                310                315                320
85 Ala Thr Gly Gln Glu Lys Cys Trp Gln Trp Phe Glu Arg Val His Asp
86                325                330                335
88 Tyr Ala Trp Ser His Phe Ala Asp Pro Glu Tyr Gly Glu Trp Phe Gly
89                340                345                350
91 Tyr Leu Asn Arg Arg Gly Glu Val Leu Leu Asn Leu Lys Gly Gly Lys
92                355                360                365
94 Trp Lys Gly Cys Phe His Val Pro Arg Ala Leu Trp Leu Cys Ala Glu
95                370                375                380
97 Thr Leu Gln Leu Pro Val Ser
98 385                390
101 <210> SEQ ID NO: 2
102 <211> LENGTH: 1173
103 <212> TYPE: DNA
104 <213> ORGANISM: Synechocystis sp.(PCC6803)
106 <100> SEQUENCE: 2
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108 Met Ile Ala His Arg Arg Gln Glu Leu Ala Gln Gln Tyr Tyr Gln Ala
109 1 5 10 15
111 tta cac cag gac gta ttg ccc ttt tgg gaa aaa tat tcc etc gat cgc 96
112 Leu His Gln Asp Val Leu Pro Phe Trp Glu Lys Tyr Ser Leu Asp Arg
113 20 25 30
115 cag ggg ggc ggt tac ttt acc tgc tta gac cgt aaa ggc cag gtt ttt 144
116 Gln Gly Gly Gly Tyr Phe Thr Cys Leu Asp Arg Lys Gly Gln Val Phe
117 35 40 45
119 gac aca gat aaa ttc att tgg tta caa aac cgt cag gta tgg cag ttt 192
120 Asp Thr Asp Lys Phe Ile Trp Leu Gln Asn Arg Gln Val Trp Gln Phe
121 50 55 60
123 gcc gtt ttc tac aac cgt ttg gaa cca aaa ccc caa tgg tta gaa att 240
124 Ala Val Phe Tyr Asn Arg Leu Glu Pro Lys Pro Gln Trp Leu Glu Ile
125 65 70 75 80
127 gcc cgc cat ggt gct gat ttt tta gct cgc cac ggc cga gat caa gac 288
128 Ala Arg His Gly Ala Asp Phe Leu Ala Arg His Gly Arg Asp Gln Asp
129 85 90 95
131 ggt aat tgg tat ttt gct ttg gat cag gaa ggc aaa ccc ctg cgt caa 336
132 Gly Asn Trp Tyr Phe Ala Leu Asp Gln Glu Gly Lys Pro Leu Arg Gln
133 100 105 110
135 ccc tat aac gtt ttt tcc gat tgc ttc gcc gcc atg gcc ttt agt caa 384
136 Pro Tyr Asn Val Phe Ser Asp Cys Phe Ala Ala Met Ala Phe Ser Gln
137 115 120 125

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RAW SEQUENCE LISTING

PATENT APPLICATION US/09/645,321

DATE: 09/14/2000

TIME: 16:50:58

Input Set : A:\Cpgg.pto

Output Set: N:\CRF3\09142000\I645321.raw

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139 tat gcc tta gcc agt ggg ggg cag gaa gct aaa gcc att gcc ctg cag 132
140 Tyr Ala Leu Ala Ser Gly Ala Gln Glu Ala Lys Ala Ile Ala Leu Gln
141 130 135 140
143 gcc tac aat aac gtc cta cgc cgt cag cac aat ccc aaa ggt caa tac 480
144 Ala Tyr Asn Asn Val Leu Arg Arg Gln His Asn Pro Lys Gly Gln Tyr
145 145 150 155 160
147 gag aag tcc tat cca ggt act aga ccc ctg aaa tcc ctg ggg ctg ccg 528
148 Glu Lys Ser Tyr Pro Gly Thr Arg Pro Leu Lys Ser Leu Ala Val Pro
149 165 170 175
151 atg att tta gcc aac ctg acc ctg gag atg gaa tgg tta tta ccg cct 576
152 Met Ile Leu Ala Asn Leu Thr Leu Glu Met Glu Trp Leu Leu Pro Pro
153 180 185 190
155 act acc gtg gaa gag gtg ttg gcc caa acc gtc aga gaa gtg atg acg 624
156 Thr Thr Val Glu Glu Val Leu Ala Gln Thr Val Arg Glu Val Met Thr
157 195 200 205
159 aat ttc ctg aac cca gaa ata gga tta atg cgg gaa ggg gtg acc ccc 672
160 Asp Phe Leu Asp Pro Glu Ile Gly Leu Met Arg Glu Ala Val Thr Pro
161 210 215 220
163 aca gga gaa ttt gtt gat agt ttt gaa ggg cgg ttg ctg aac cca gga 720
164 Thr Gly Glu Phe Val Asp Ser Phe Glu Gly Arg Leu Leu Asn Pro Gly
165 225 230 235 240
167 cac ggc att gaa gcc atg tgg ttc atg atg gac att gcc caa cgc tcc 768
168 His Gly Ile Glu Ala Met Tip Phe Met Met Asp Ile Ala Gln Arg Ser
169 245 250 255
171 ggc gat cgc cag tta cag gag caa gcc att gca gtg gtg ttg aac acc 816
172 Gly Asp Arg Gln Leu Gln Glu Gln Ala Ile Ala Val Val Leu Asn Thr
173 260 265 270
175 ctg gaa tat gcc tgg gat gaa gaa ttt ggt gcc ata ttt tat ttc ctt 864
176 Leu Glu Tyr Ala Trp Asp Glu Glu Phe Gly Gly Ile Phe Tyr Phe Leu
177 275 280 285
179 gat cgc cag ggc cac cct ccc caa caa ctg gaa tgg gac caa aag ctg 912
180 Asp Arg Gln Gly His Pro Pro Gln Gln Leu Glu Trp Asp Gln Lys Leu
181 290 295 300
183 tgg tgg gta cat ttg gaa acc ctg gtt gcc cta gcc aag ggc cac caa 960
184 Trp Trp Val His Leu Glu Thr Leu Val Ala Leu Ala Lys Gly His Gln
185 305 310 315 320
187 gcc act ggc caa gaa aaa tgt tgg caa tgg ttt gag cgg gtc cat gat 1008
188 Ala Thr Gly Gln Glu Lys Cys Trp Gln Trp Phe Glu Arg Val His Asp
189 325 330 335
191 tac gcc tgg agt cat ttc gcc gat cct gag tat ggg gaa tgg ttt gcc 1056
192 Tyr Ala Trp Ser His Phe Ala Asp Pro Glu Tyr Gly Glu Trp Phe Gly
193 340 345 350
195 tac ctg aat cgc cgg gga gag atg tta ctg aac cta aaa ggg ggg aaa 1104
196 Tyr Leu Asn Arg Arg Gly Glu Val Leu Leu Asn Leu Lys Gly Gly Lys
197 355 360 365
199 tgg aaa ggg tgc ttc cac gta ccc cga act ctg tgg ctg tgt ggc gaa 1152
200 Trp Lys Gly Cys Phe His Val Pro Arg Ala Leu Trp Leu Cys Ala Glu
201 370 375 380
203 act ctg caa ctt ccg gtt agt 1173

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RAW SEQUENCE LISTING DATE: 09/14/2000
 PATENT APPLICATION: US/09/645,321 TIME: 16:50:58

Input Set : A:\Cpg.pto
 Output Set: N:\CRF3\09142000\I645321.raw

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204 Thr Leu Gln Leu Pro Val Ser
205 385                               390
208 <210> SEQ ID NO: 3
209 <211> LENGTH: 24
210 <212> TYPE: DNA
211 <213> ORGANISM: Artificial Sequence
213 <220> FEATURE:
214 <223> OTHER INFORMATION: Synthetic DNA
216 <400> SEQUENCE: 3
217 gtgtaagctt tctgtatggg gtgt                24
220 <210> SEQ ID NO: 4
221 <211> LENGTH: 26
222 <212> TYPE: DNA
223 <213> ORGANISM: Artificial Sequence
225 <220> FEATURE:
226 <223> OTHER INFORMATION: Synthetic DNA
228 <400> SEQUENCE: 4
229 gcagggatec caaccaggca gcggaa                26
232 <210> SEQ ID NO: 5
233 <211> LENGTH: 32
234 <212> TYPE: DNA
235 <213> ORGANISM: Artificial Sequence
237 <220> FEATURE:
238 <223> OTHER INFORMATION: Synthetic DNA
240 <400> SEQUENCE: 5
241 ttatcgata ttaattaggg ggaatgaatg ag          32
244 <210> SEQ ID NO: 6
245 <211> LENGTH: 33
246 <212> TYPE: DNA
247 <213> ORGANISM: Artificial Sequence
249 <220> FEATURE:
250 <223> OTHER INFORMATION: Synthetic DNA
252 <400> SEQUENCE: 6
253 ttggatcct cattattccc cctgattttt gaa        33
256 <210> SEQ ID NO: 7
257 <211> LENGTH: 36
258 <212> TYPE: DNA
259 <213> ORGANISM: Artificial Sequence
261 <220> FEATURE:
262 <223> OTHER INFORMATION: Synthetic DNA
264 <400> SEQUENCE: 7
265 taaatcgata ttgtatgat tgcacatgc cgtcag      36
268 <210> SEQ ID NO: 8
269 <211> LENGTH: 36
270 <212> TYPE: DNA
271 <213> ORGANISM: Artificial Sequence
273 <220> FEATURE:
274 <223> OTHER INFORMATION: Synthetic DNA
276 <400> SEQUENCE: 8

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RAW SEQUENCE LISTING
PATENT APPLICATION: US/09/645,321

DATE: 09/14/2000
TIME: 16:50:58

Input Set : A:\Cpg.pto
Output Set: N:\CRF3\09142000\I645321.raw

277 aaaggatcct taactaacgg gaagttggag agtttc

36

VERIFICATION SUMMARY

DATE: 09/14/2000

PATENT APPLICATION: US/09/645,321

TIME: 16:50:59

Input Set : A:\Cpg.pto

Output Set: N:\CRF3\09142000\I645321.raw

L:12 M:270 C: Current Application Number differs. Replaced Current Application No

L:12 M:271 C: Current Filing Date differs. Replaced Current Filing Date

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/645,321

DATE: 09/06/2000

TIME: 11:55:35

Input Set : A:\5.1183 sequence.txt

Output Set: N:\CRF3\09062000\I645321.raw

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139 Gly Asn Trp Tyr Phe Ala Leu Asp Gln Glu Gly Lys Pro Leu Arg Gln
140      100      105      110
E--> 142 ccc tat aac gtt ttt tcc gat tgc ttc gcc gcc atg gcc ttt agt caa
E--> 143 384
144 Pro Tyr Asn Val Phe Ser Asp Cys Phe Ala Ala Met Ala Phe Ser Gln
145      115      120      125
E--> 147 tat gcc tta gcc agt ggg gcg cag gaa gct aaa gcc att gcc ctg cag
E--> 148 432
149 Tyr Ala Leu Ala Ser Gly Ala Gln Glu Ala Lys Ala Ile Ala Leu Gln
150      130      135      140
E--> 152 gcc tac aat aac gtc cta cgc cgt cag cac aat ccc aaa ggt caa tac
E--> 153 480
154 Ala Tyr Asn Asn Val Leu Arg Arg Gln His Asn Pro Lys Gly Gln Tyr
155 145      150      155      160
E--> 157 gag aag tcc tat cca ggt act aga ccc ctc aaa tcc ctg gcg gtg ccg
E--> 158 528
159 Glu Lys Ser Tyr Pro Gly Thr Arg Pro Leu Lys Ser Leu Ala Val Pro
160      165      170      175
E--> 162 atg att tta gcc aac ctc acc ctg gag atg gaa tgg tta tta ccg cct
E--> 163 576
164 Met Ile Leu Ala Asn Leu Thr Leu Glu Met Glu Trp Leu Leu Pro Pro
165      180      185      190
E--> 167 act acc gtg gaa gag gtg ttg gcc caa acc gtc aga gaa gtg atg acg
E--> 168 624
169 Thr Thr Val Glu Glu Val Leu Ala Gln Thr Val Arg Glu Val Met Thr
170      195      200      205
E--> 172 gat ttc ctc gac cca gaa ata gga tta atg cgg gaa gcg gtg acc ccc
E--> 173 672
174 Asp Phe Leu Asp Pro Glu Ile Gly Leu Met Arg Glu Ala Val Thr Pro
175      210      215      220
E--> 177 aca gga gaa ttt gtt gat agt ttt gaa ggg cgg ttg ctc aac cca gga
E--> 178 720
179 Thr Gly Glu Phe Val Asp Ser Phe Glu Gly Arg Leu Leu Asn Pro Gly
180 225      230      235      240
E--> 182 cac ggc att gaa gcc atg tgg ttc atg atg gac att gcc caa cgc tcc
E--> 183 768
184 His Gly Ile Glu Ala Met Trp Phe Met Met Asp Ile Ala Gln Arg Ser
185      245      250      255
E--> 187 ggc gat cgc cag tta cag gag caa gcc att gca gtg gtg ttg aac acc
E--> 188 816
189 Gly Asp Arg Gln Leu Gln Glu Gln Ala Ile Ala Val Val Leu Asn Thr
190      260      265      270
E--> 192 ctg gaa tat gcc tgg gat gaa gaa ttt ggt gcc ata ttt tat ttc ctt
E--> 193 864
194 Leu Glu Tyr Ala Trp Asp Glu Glu Phe Gly Gly Ile Phe Tyr Phe Leu
195      275      280      285
E--> 197 gat cgc cag ggc cac cct ccc caa caa ctg gaa tgg gac caa aag ctc
E--> 198 912
199 Asp Arg Gln Gly His Pro Pro Gln Gln Leu Glu Trp Asp Gln Lys Leu

```

refer
to
p. 1

RAW SEQUENCE LISTING
PATENT APPLICATION US/09/645,321

DATE: 09/05/2000
TIME: 11:55:35

Input Set : A:\5.1183 sequence.txt
Output Set: N:\CRE3\09062000\I645321.raw

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200      290      295      300
E--> 202 tgg tgg gta cat ttg gaa acc ctg gtt gcc cta gcc aag ggc cac caa
E--> 203 960
204 Trp Trp Val His Leu Glu Thr Leu Val Ala Leu Ala Lys Gly His Gln
205 305      310      315      320
E--> 207 gcc act ggc caa gaa aaa tgt tgg caa tgg ttt gag cgg gtc cat gat
E--> 208 1008
209 Ala Thr Gly Gln Glu Lys Cys Trp Gln Trp Phe Glu Arg Val His Asp
210      325      330      335
E--> 212 tac gcc tgg agt cat ttc gcc gat cct gag tat ggg gaa tgg ttt ggc
E--> 213 1056
214 Tyr Ala Trp Ser His Phe Ala Asp Pro Glu Tyr Gly Glu Trp Phe Gly
215      340      345      350
E--> 217 tac ctg aat cgc cgg gga gag gtg tta ctc aac cta aaa ggg ggg aaa
E--> 218 1104
219 Tyr Leu Asn Arg Arg Gly Glu Val Leu Leu Asn Leu Lys Gly Gly Lys
220      355      360      365
E--> 222 tgg aaa ggg tgc ttc cac gtg ccc cga gct ctg tgg ctc tgt gcg gaa
E--> 223 1152
224 Trp Lys Gly Cys Phe His Val Pro Arg Ala Leu Trp Leu Cys Ala Glu
225      370      375      380
E--> 227 act ctc caa ctt ccg gtt agt
E--> 228 1173
229 Thr Leu Gln Leu Pro Val Ser
230 385      390
233 <210> SEQ ID NO: 3
234 <211> LENGTH: 24
235 <212> TYPE: DNA
236 <213> ORGANISM: Artificial Sequence
238 <220> FEATURE:
239 <223> OTHER INFORMATION: Synthetic DNA
241 <100> SEQUENCE: 3
E--> 242 gtgtaagctt tctgtatggg gtgt
243 24
246 <210> SEQ ID NO: 1
247 <211> LENGTH: 26
248 <212> TYPE: DNA
249 <213> ORGANISM: Artificial Sequence
251 <220> FEATURE:
252 <223> OTHER INFORMATION: Synthetic DNA
254 <100> SEQUENCE: 1
E--> 255 gcagggatcc caaccaggca gcggaa-
256 26
259 <210> SEQ ID NO: 5
260 <211> LENGTH: 32
261 <212> TYPE: DNA
262 <213> ORGANISM: Artificial Sequence
264 <220> FEATURE:
265 <223> OTHER INFORMATION: Synthetic DNA

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referred
to
p. 1

same, p. 1

same, p. 1

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/645,321

DATE: 09/06/2000
TIME: 11:55:23Input Set : A:\5.1183 sequence.txt
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267 <400> SEQUENCE: 5
E--> 268 tttatcgata ttaattaggg ggaatgaatg ag
269 32
272 <210> SEQ ID NO: 6
273 <211> LENGTH: 33
274 <212> TYPE: DNA
275 <213> ORGANISM: Artificial Sequence
277 <220> FEATURE:
278 <223> OTHER INFORMATION: Synthetic DNA
280 <400> SEQUENCE: 6
E--> 281 ttggatcct cattattccc cctgattttt gaa
282 33
285 <210> SEQ ID NO: 7
286 <211> LENGTH: 36
287 <212> TYPE: DNA
288 <213> ORGANISM: Artificial Sequence
290 <220> FEATURE:
291 <223> OTHER INFORMATION: Synthetic DNA
293 <400> SEQUENCE: 7
E--> 294 taaatcgata ttgtatgat tgcccatcgc cgtcag
E--> 295 36
298 <210> SEQ ID NO: 8
299 <211> LENGTH: 36
300 <212> TYPE: DNA
301 <213> ORGANISM: Artificial Sequence
303 <220> FEATURE:
304 <223> OTHER INFORMATION: Synthetic DNA
306 <400> SEQUENCE: 8
E--> 307 aaaggatcct taactaaccg gaagttggag agtttc
E--> 308 36

Same
refer to
p. 1